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Does e-Governance Mitigate the Political Budget Cycle?

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Abstract. This paper studies the impact of governmental transparency on the political business cycle. The literature on electoral cycles finds evidence that cycles depend on the stage of the economy. However, we show a reliance of the cycle on transparency. We use data for G7 countries and compare it with less developed OECD countries. Our theory states that transparency reduces the political cycles due to peer pressure and by voting outs. We confirm the theory with an econometric assessment of 34 countries from 1970 to 2012. We discover smaller cycles in countries with a higher transparency, especially in G7-countries.

Keywords: Political Cycles, Transparency, e-Governance, Google Search

1. Introduction

In the past decades, governments develop more and more transparency measures with a growing relevance of the Internet. During the US presidential election of 2012 or the election campaign of the German Bundestag in 2013, the Internet and social media played an important role too. In addition, even political events such as the fall of Mubarak in Egypt or the Syrian revolution in April 2011, has demonstrated the importance of social media. The worldwide and mobile access is a new source of information and a catalyst for more transparency. Parallel to these developments, governments used the Internet for their own sake. The key word is 'e-governance'. E-governance means that governments use the information and communications technologies (ICT) to interact with citizens and voters. This includes but is not limited to two-way information flow, efficient processing of administrative issues and the delivery of various services. The ultimate goals of e-governance are that, at the end, everyone gets a better overview what governments do. This is strengthening political procedures and participation.

Earlier research in this field demonstrated that economic welfare is influenced through actions of governments. There is empirical evidence that politicians focus more on times shortly before elections. They try to manipulate the voters' decision by promising higher economic well-being after elections. This is commonly known as the 'political budget cycle' (PBC). Taking into account the existence of political cycles, we study the impact of increasing transparency to the cycles. We demonstrate that recent developments via the Internet and social media have changed the size of the budget cycles. To our knowledge, this paper is the first that studies the question of the budget cycles and transparency as well as e-governance. We evaluate this by using data for 34 OECD (Organization for Economic Cooperation and Development) countries over the time period from 1970 to

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2012. We find evidence which is confirmed by the empirical results that higher transparency mitigates the political cycles, measured with the standard deviation and amplitude.

In the section 2, we review the literature. In section 3, we develop our idea and derive a econometric equation. Next, we examine the empirical results in sections 4 and 5. Section 6, concludes the paper.

2. Literature Review

Nordhaus [1], Alesina [2] and Persson & Tabellini [3] are the main contributors to literature regarding the political budget cycle. Contrary to our expectations, however, almost no articles connect the political budget cycle with transparency and e-governance measures.

In 1975, Nordhaus [4] came up with the idea of the political budget cycle. Using the Philips curve trade-off as starting point, he asked which decisions politicians take and how governments 'chose between present welfare and future welfare' [4], especially shortly before elections. As a result of his work, he found that early phases of a government's term show high unemployment rates and low public expenditure, whereas later phases of the election term show low unemployment rates and increased public expenditure. Around this finding, a huge literature developed, which we will further extend with the paper on hand. We use a sample of 34 OECD countries to find a relationship between the magnitude of a political business and transparency in the respective economy. In order to do so we mainly introduce e-governance and further transparency measures.

In a more detailed approach, Paldam [5] focuses on a government's actions while they are elected power. He sees a 'stable' government as one that will complete the whole election period and assumes that their political actions are determined before they come to power. As consequence, 'a restrictive policy in the beginning of an election period [is] followed by an expansive phase later on' [5]. As governments want to be re-elected, they make unpopular decisions in an early phase of the electoral cycle and strive to please their voters shortly before elections. Rogoff [6] calls such behaviour 'a consumption binge, in which taxes are cut, transfers are raised and government spending is distorted towards projects with high immediate visibility'. Although the direct economic well-being is not directly impacted by monetary and fiscal actions, voters are influenced by these actions [7].

Drazen [8] concludes that 'although there is (...) agreement that aggregate economic conditions affect election outcomes (...), there is significant disagreement on about whether there is opportunistic manipulation'. In short, this means that it is unclear whether the behaviour of voters is at all impacted by the very small effects on the economic situation that politicians action's can have.

Even if most of the voters are informed that the government wants to be re-elected and therefore pleases them, governments tend to follow an expansive fiscal policy anyway [9]. In addition, further empirical literature finds the political budget cycle being less in developing countries [9]; [10].

Several authors including but not limited to Nordhaus [4] and MacRae [11] find evidence for a political budget cycle. Others, like McCallum [12], Alesina & Robini [13] and more cannot find sufficient evidence and therefore question the general existence of these cycles. According to Sargent & Wallace [14] boom phases cannot be artificially created whenever politicians need them. Rogoff & Sibert [15] assume that voters are rational being and explain the temporary presence of political budget cycles with timely limited information asymmetries.

During the beginnings of the Internet, its influence on the political budget cycle was negligible. The mobile age, however, and especially the emergence of web 2.0, e-governance and online election campaigns had a significant impact on the political budget cycle. Alt & Lassen [16] find that 'the evidence linking transparency and fiscal policy outcomes is less compelling'. Based on current observations and developments, this hypothesis is challenged by the paper on hand. The Arabic spring is one of several recent events that demonstrated that social media, mobile access to the Internet, increasing e-governance and developing public transparency are increasingly influencing public and political discussions.

Several assumptions are a prerequisite for analysing the available data. Politicians strive to be re-elected again as their goal is to keep and increase their power. Consequently, they often decide in favour of their voters. Moreover, voters only goal is to improve their own economic situation. To do so, they always behave rationally. Lastly, we assume that the economy can sufficiently be influenced by political actions. Nordhaus [1] takes the same assumptions and adds that 'many politico-economic models assume that voters do not possess all available information' [1]. Although we generally agree with this assumption, we add that political decisions become more transparent through the rapid development of the Internet. This development also influences the forward-looking behaviour of voters and changes the way decisions are made. Starting with Nordhaus' classical theory, our theoretical framework extends the budget cycle through taking into account all the points mentioned. From a theoretical standpoint it is easily possible to explain that increasing transparency and e-governance will mitigate the political budget cycle.

3. Data and Econometric Methodology

Although fiscal transparency was a key component in the discussion about public finance for many years, still no unified measure for it exists. In the existing literature, various definitions and measurement for transparency can be found. On the one hand, 'government transparency' is done through expert ratings [17]. On the other hand, various international organisations developed their individual indices for transparency. At first, the paper on hand applies several standard measurements. In addition to that, Google search data is used. Using this type of data is completely new approach which cannot be found in literature so far.

Our data sample includes 34 OECD countries. They are split in the G7 countries (Canada, France, Germany, Italy, Japan, the United Kingdom and the United States) and Australia on the one hand. On the other hand, we classify Austria, Belgium, Chile, Czech Republic, Denmark, Estonia, Finland, Greece, Hungary, Iceland, Ireland, Israel, Republic of Korea, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, and Turkey as other-countries. The data we apply is comparable to what is used in the literature for the last decades. We use various typical economic indicators like unemployment rate, disposable income, real and nominal GDP, public expenditure, debt and public deficit. With regard to election we use data from presidential or federal parliamentary elections, depending on which election is more significant and important in the respective country. Wherever we have the data on hand, it is used for the years from 1970 to 2012.

What was called 'clarity of responsibility' by Powell & Whitten [18] can be created through increased transparency [16]. The results of a politician's action and its results can be more easily affirmed if sufficient transparency is in place. Through increased transparency, political actions are more visible and apparent to a broad set of people. According to Kopits & Craig [19] transparency is 'openness toward the public at large about government structure and functions, fiscal policy intentions, public sector accounts, and projections. It involves ready access to reliable, comprehensive, timely, understandable, and internationally comparable information on government activities … so that the electorate and financial markets can accurately assess the government's financial position and the true costs and benefits of government activities, including their present and future economic and social implications'. Alt & Lassen [20] use four different categories to define a transparency index. In our case, various variables are used to get a measure for transparency. People need access to the Internet in order to use e-governance. We capture that through broadband subscriptions per 100 inhabitants. Moreover, the UN E-Government surveys from 2004 onwards include a so-called e-participation index. This index includes how information is provided to the citizens, how citizens can give their input towards public services and policies and finally how much power citizens have in improving service components and developing new policies. Finally, we use Google search data. Thereby, we not only measure transparency in a new way but also extend the existing literature through taking a new approach. Our expectations with regard to how transparency changes the political budget cycle are similar to the existing literature: First, policy information should be made more accessible through procedures with increased transparency. Second, people are willing to commit more to

necessary reforms. Third, decisions with regard to new policy will be publicly more explained and justified. Fourth, each action of politicians will be verified by independent citizens. The data used for that comes from an analysis of Google Trends. Main keywords including election, government and others were applied for all 34 OECD countries over a ten year time.

We estimate a PBC model, according to the following equation

$$Y_{i,t} = \alpha_i + \sum_{k=1}^{p} \beta_{i,k} \boldsymbol{Y}_{i,t-k} + \gamma D_{i,t} + \epsilon_{i,t}$$

where $Y_{i,t}$ is the cycle in country i in year t, α_i is a country fixed effect, $D_{i,t}$ is an election dummy, and $\epsilon_{i,t}$ is an error term in country i and at time t. The term $Y_{t-k,i}$ is a lag variable and contains also control variables. As long as the dummy is exogenous, the OLS estimation is unbiased.

4. Empirical Results and Discussion

In this section, we study the effect of transparency on the political budget cycle empirically. Interestingly, there already exists an implicit prove of our hypothesis by Persson & Tabellini (1990) and Brender & Drazen [21]. Both papers find the absence of an electoral cycle if they restrict the sample to industrialized countries which are according to our finding also more transparent than developing countries. However, we show that the existence of cycle is not only dependent on the state of the economy but rather on transparency. By studying the debt levels, we find for G7 countries and Australia perfect mitigation of the debt cycle over time (Figure 1). While the ups and downs are almost unchanged, the standard deviation and amplitude are declining over time.

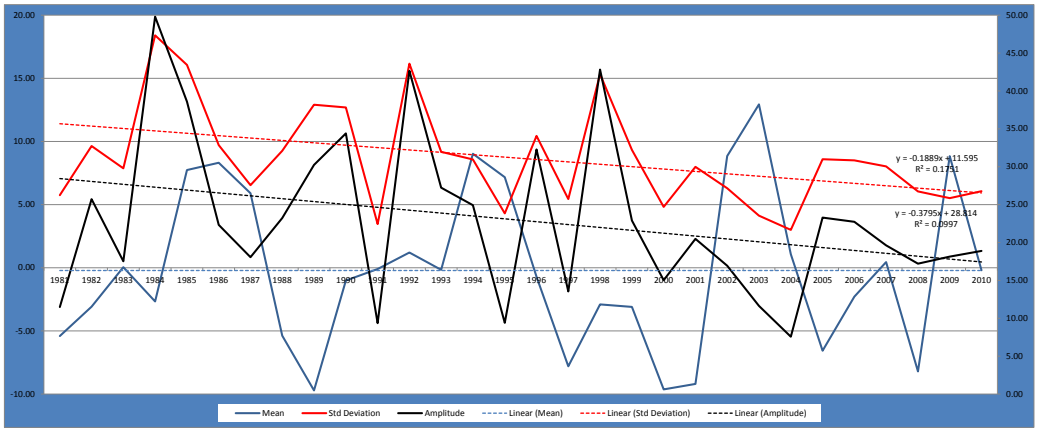

Figure 1: PBC of G7 Countries and Australia, Debt Levels, 1981-2010; Source: OECD, author's calculation.

All transparency indicators demonstrate that this is mostly the case for the G7 countries and Australia because they are also leading in terms of transparency. Therefore, we split the data in G7 including Australia and non-G7 countries – later so-called 'other-countries'. Table 1 contains the results. Firstly, we look to the mean values of the public deficit, debt and expenditure in respect to GDP. Comparing G7 including Australia and the other-countries shows the expected result. The last two rows in Table 1, represent information about the development of transparency, over time and across both country groups.

To demonstrate that the ups and downs are mitigated, we compute the standard deviation and amplitude of the cycles. In almost all cases we find smaller standard deviation and amplitudes in countries that have higher values in terms of transparency. Unfortunately, only the expenditure amplitude is significantly at a 1 percent level. Thus the first impression indicated by Table 1 is not necessarily statistically significant for all measures. Looking to the other-countries, the declining trend is negligible or insignificant. From previous empirical studies, we know that public expenditure and deficit are the key variables. A close look to the dynamics of transparency demonstrates the difference between G7 including Australia and other-countries. Finally, this finding confirms

our hypothesis and is even statistical significant.1 The mean value of the transparency is not only significantly higher, it is also less volatile for G7 countries and Australia.

Table 1: Development of Key Indicators - Mitigation of Political Business Cycle; Source: Author's calculations.

		G7 Countries and Australia			Other Countries		
		1980-1989	1990-1999	2000-2010	1980-1989	1990-1999	2000-2010
Deficit in % of GDP	Mean	-4.572	-3.820	-2.888	-1.920	-2.146	-1.034
	Std. Dev.	3.512	2.940	2.642	4.554	3.375	4.873
	Amplitude	9.719	9.160	7.630	16.597	12.691	25.010
Debt in % of GDP	Mean	-0.471	0.161	-0.360	-0.019	-0.460	-0.039
	Std. Dev.	10.682	9.489	6.270	9.516	9.832	11.572
	Amplitude	23.696	25.949	17.410	42.537	49.704	58.133
Expenditure in % of GDP	Mean	19.248	18.855	19.365	13.667	18.678	19.261
	Std. Dev.	2.856	2.938	2.351	9.989	5.661	4.703
	Amplitude	8.518	9.268	7.625	33.293	21.147	16.378
Broadband Subscription	Mean		0.239	15.260		0.160	13.202
	Std. Dev.		0.329	3.342		0.000	7.328
	Amplitude		0.803	9.647		0.470	25.518
e-Participation Index	Mean			0.648			0.412
	Std. Dev.			0.263			0.239
	Amplitude			0.728			0.834

To further check our results, we use a unique and new measure which is Google search data. We estimate panel regressions together with the Google data. Generally, all evidence confirms our findings above even if the results are just weakly significant. We show that the rather weak significance has to do with the rather recent developments of e-governance, e-participating. Thus to obtain more robust and long-run measures we do need long-time series which are unavailable today.

According to Da, Engelberg & Goa [22], Google search data can be used as a measure for attention. Google data are only available since 2004. Based on these Google time series, we estimate a factor model first and develop for every country a special Google factor. Again, we separate the data between G7 including Australia and other-countries. Finally, we compute the mean, the standard deviation and amplitude of the Google searches (Figure 2). For all countries, the Google factors indicate that online attention declines over time. Both the solid and dashed blue curve represents the mean attention for G7 including Australia and other-countries respectively. Not surprisingly at the beginning the mean attention is higher for G7 including Australia but only until 2009. Notably since then, the mean attentions have similar levels for all governments in general. This remarkable development is an indication that public transparency was higher in the past for the G7 countries and Australia, however assimilated to other-countries in the recent years. Since the search numbers are not the number of absolute searches rather relative numbers, it is not astonishing that the numbers decline as more people search via Google. Today the online search is undoubtedly higher than 10 years ago. The standard deviation and amplitude of Google have thus declining trends for both groups of countries. Finally, a striking pattern is the peak in the dashed curves between 2009 and 2010. This time period is the so-called 'Great Recession' in the macroeconomics literature. The two years signal the global financial and economic crisis which was almost as severe as the 'Great Depression' in the 1930s. Interestingly, public attention to smaller countries during that time period was significantly higher in comparison to the G7 countries and Australia.

Next, we estimate a regression model to confirm the previous findings. We check the data by doing some regressions to cross-check. In Table 2, we estimate the public debt-to-GDP in respect to the independent variables public expenditures, revenues, disposable income, nominal and real GDP, unemployment and an election-year dummy variable. The data ranges from 1970 to 2012. We split the sample into three models: Model 1 all countries; Model 2 G7 countries including Australia and Model 3 other-countries.

[1] Further statistical details are available upon request from the authors.

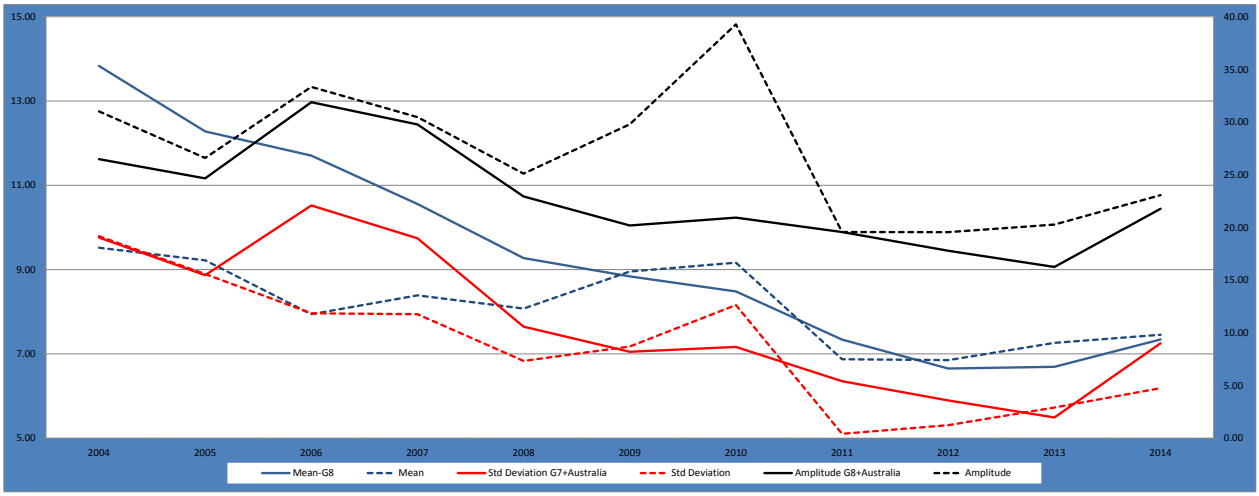

Figure 2: Google Search (G7 and Australia solid and other countries dashed curves), 2004-2014; Source: Google Trend, author's calculation.

In general, the coefficients have the expected signs. For instance look at the coefficient for unemployment. It is positive and significance at 1 percent. This means that the higher unemployment leads to higher public debt which is an obvious relationship due to more unemployment expenditures. Similar findings are for public expenditure and disposable income. The negative signs for nominal GDP and real GDP are again expected. GDP is in the denominator of the debt-to-GDP ratio. Public revenue has an unexpected sign. However, the positive sign is a common finding in public finance literature due to a political economy argument. Every monetary unit of tax revenues finds almost automatically a spending purpose. Thus consolidation of public finance does not work with more revenues it only works with less revenues. This is a robust empirical finding in the literature [7]. The election dummy variable is not significant. This is not unsurprising in the literature again. Overall, the three models have high R-squared and therefore they sufficiently explain the dynamics.

Table 2: Political Business Cycle I; Source: Author's estimation.

Varialbes	Model 1 - Public Debt	Model 2 - G7+Australia - Public Debt	Model 3 - Others - Public Debt
Constant	-2241520.00	-9425292	-16963.67
	-5.477***	-7.572301***	-0.344964
Expenditure	62696.38	255433.1	6860.422
	3.846***	5.517775***	3.085929***
Revenues	36909.85	129307.1	-1555.752
	4.146***	5.510447***	-1.565488
Disposable Income	11.39	5.76094	0.755026
	9.739***	2.878273***	10.38638***
Nominal GDP	-9118.96	-4396.042	-207.0887
	-7.720***	-2.212449**	-0.350564
Real GDP	-1.74	-0.379926	-0.607137
	-5.698***	-0.772855	-5.988803***
Unemployment	15861.30	103343.2	3713.84
	6.137***	2.845757***	3.615824***
Election Dummy	16974.08	19458.2	69.80796
	0.40	0.181305	0.016771
Estimation Method	Panel, Fixed effect	Panel, Fixed effect	Panel, Fixed effect
N countries	31	8	23
R-squared	0.9200	0.94034	0.92849
F-statistic	140.3263***	132.8475***	129.0024***

Note: Time series form 1970 to 2012. Numbers below the coefficients are t-values with signficant levels. *** significant at 1%, ** significant at 5%, and * significant at 10%.

Let me summarize the main findings. First, transparency is higher in G7 countries including Australia. Second, transparency is mitigated, measured by the amplitude of the public deficit cycle, over time. It is interesting that the recent financial and economic crisis in the years of 2007 to 2008 had massive effects on public deficits in the other-countries as already noted earlier. But despite the crisis our results are robust and move in the right direction. Of course, our study has limitations. Most of the limitation can be solved and is a topic of future research. One issue is the short time series in particular for transparency or e-governance data. Another issue is that the election dummy is not significance as expected from theory. This is however similar to many empirical studies in this field. Fortunately, this is not a major weakness in this paper because our question is rather different. We were interested in the impact of and the mitigation of the amplitude and standard deviation of budget cycle over time.

5. Conclusion

As demonstrated in the paper on hand, the level of transparency influences the magnitude of the political budget cycle. In the course of time, the political cycle is mitigated through an increased transparency. G7 countries including Australia are obviously more advanced with regard to e-governance and e-participation and therefore have a higher public transparency in their procedures. Consequently, the findings are more significant for this set of countries. We extended the existing research questions and through using new data sets during our empirical analysis we can proof our new model, including its inherent theoretical proposition. Going forward into the future, the used Google data will stimulate more empirical work.

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